

REMARKS

In the Advisory Action mailed on **September 22, 2004**, the examiner reviewed claims 1-9, 12-20, and 23-24. Claims 1-9, 12-20, and 23-24 were rejected under 35 U.S.C. §102(b) as being anticipated by Marcuello et al. (*Value Prediction for Speculative Multithreaded Architectures*, hereinafter Marcuello (1)), and further by Marcuello et al. (*Speculative Multithreaded Processors*, hereinafter Marcuello (2)), incorporated by reference in Section 2 of Marcuello(1).

Rejections under 35 U.S.C. §103(a)

Claims 1-9, 12-20, and 23-24 were rejected under 35 U.S.C. §102(b) as being anticipated by Marcuello (1), and further by Marcuello (2), incorporated by reference in Section 2 of Marcuello (1).

Applicant respectfully points out that Marcuello (2) teaches away from the present invention. Specifically, Marcuello (2) teaches that “*in case of misprediction, this thread and the following ones are squashed*” (see Marcuello (2), col. 4, lines 54-57). Moreover, “*When the non speculative thread finishes an iteration of a loop, all the **speculative threads of this loop are squashed** if the branch is not taken*” (see Marcuello (2), col. 5, lines 31-33). Note that squashing a speculative thread is tantamount to terminating the speculative thread.

In contrast, the present invention is directed towards rolling back a speculative thread (see page 4, lines 12-14, page 5, lines 10-12, page 10, lines 9-23, page 16, lines 1-4). Specifically, “*the system causes the speculative thread to roll back to undo any results generated by the speculative thread*” (see page 20, lines 15-17). Note that **rolling back a speculative thread implies that the speculative thread is not squashed**; instead, the speculative thread is rolled back to an earlier execution point.

Note that the process of rolling back a speculative thread to undo any results generated by the speculative thread is not obvious because it involves the

complex operations described on page 14, line 13 through page 17, line 21. Specifically, “*the current time in the time dimension of the system is advanced discretely at a join or a rollback*” (see page 14, lines 17-18). Moreover, read bits are used to keep track of which fields within a data region have been read since the last rollback (see page 14, lines 22-23).


Accordingly, Applicant has amended independent claims 1, 12, and 23 to clarify that the present invention performs a rollback operation for the speculative thread to undo actions performed by the speculative thread. These amendments find support in page 4, lines 12-14, and page 20, lines 15-17. Furthermore, Applicant has canceled dependent claims 2, 13, and 24 without prejudice.

Hence, Applicant respectfully submits that independent claims 1, 12, and 23 as presently amended are in condition for allowance. Applicant also submits that claims 3-9, which depend upon claim 1, and claims 14-20, which depend upon claim 12, are for the same reasons in condition for allowance and for reasons of the unique combinations recited in such claims.

CONCLUSION

It is submitted that the present application is presently in form for allowance. Such action is respectfully requested.

Respectfully submitted,

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